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09/934,085	08/22/2001	Rudiger Schutte	32301W198	7366

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EXAMINER	
LEUNG, JENNIFER A	
ART UNIT	PAPER NUMBER
1764	

DATE MAILED: 11/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/934,085	SCHUTTE ET AL.	
	Examiner	Art Unit	
	Jennifer A. Leung	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 August 2005 and 25 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7-21,23-33,35 and 36* is/are pending in the application.

4a) Of the above claim(s) *1-5 and 7-16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-21,23-33,35 and 36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-5,7-21,23-33,35 and 36* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Applicant's amendment submitted on May 25, 2005 and Applicant's response to the Notice of Non-Compliant Amendment submitted on August 29, 2005 have been received and carefully considered. Claims 1-5 and 7-16 are withdrawn from consideration. Claims 6, 22 and 34 are cancelled. Claims 17-21, 23-33, 35 and 36 are currently active.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 17, 19 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Schubert et al. (US 5,803,600).

Regarding claim 17, Schubert et al. (FIG. 3b; column 3, lines 48-59) discloses an apparatus comprising a reactor in which there are located a plurality of wall elements (i.e., foil elements **12b**), a plurality of slot-shaped reaction spaces (i.e., partial mixing chambers **12a**), a plurality cavities for conducting a fluid heat-exchange medium therethrough (i.e., a plurality of parallel, tubular channels **12c** within foil elements **12b** for receiving a cooling or heating medium); wherein the reaction spaces **12a** are formed between lateral surfaces of two abutting wall elements **12b** made of solid plates, arranged interchangeably in a block (i.e., a heat exchanger unit **12**) as a virtual right parallelepiped; wherein the slot-shaped reaction spaces **12a** are able to have reactants **A** and **B** supplied from the same side of the block (as illustrated in FIG.

3b, the left side of the block); and wherein the reaction spaces **12a** are oriented to guide the reaction mixture **C** through the reaction spaces **12a** in the same direction and in parallel flows. In view of the newly added structural limitations, Schubert et al. (FIG. 3b; column 3, lines 48-60; claims 1-3) further discloses the slot width "s" of the reaction spaces **12a** is between 0.05 and 5 mm (as illustrated, the width of a space **12a** is approximately the sum of the foil thicknesses that define channels **13a** and **13b**, which is roughly 200 μm or 0.2 mm).

Regarding claim 19, Schubert et al. (FIG. 3b; column 3, lines 7-31, 48-60) discloses a distributing medium (i.e., a flow guide structure **13**, similar to the flow guide structure **6** shown in FIG. 1d) on at least one side of the block **12** through which the reaction spaces **12a** are capable of being provided with the reactants **A**, **B**.

Regarding claim 20, the distributing medium **13** (FIG. 3b) is a solid body with a plurality of channels (i.e., passages **13a**, **13b**, similar to the passages **1b**, **2b** of structure **6** in FIG. 1d), the cross-sections of which, inherently, are sufficiently small to avoid spreading of flames in the course of the supply of reactants that form an explosive mixture (i.e., the grooves which define passage **13a**, **13b** have a width of less than 250 μm and a depth of less than 70 μm; claims 1-3).

Instant claims 17, 19 and 20 structurally read on the apparatus of Schubert et al.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 26-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schubert et al. (US 5,803,600) in view of Stancliffe (US 1,662,870).

The same comments with respect to Schubert et al. apply. However, Schubert et al. is

silent as to providing the instantly recited plates at the narrow sides of the wall elements, for the feeding and discharge of reactants and/or heat carrier into and out from the wall elements. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to provide such plates to the apparatus of Schubert et al., on the basis of suitability for the intended use, because such plates would provide a well known means for enabling the disclosed supply and discharge of reactants and/or heat carrier to the apparatus of Schubert et al. Stancliffe (FIG. 1) teaches a similar heat exchange apparatus comprising a plurality of wall elements **a,b** which define a plurality of grooves **c,d**, and in particular, the apparatus comprises plates **k** which cover the narrow sides of the wall elements **a,b**, in which are located openings **m** for feeding and drainage of fluids from the wall elements.

4. Claims 33, 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schubert et al. (US 5,803,600).

Regarding claims 33 and 35, Schubert et al. further discloses a partition being mounted onto the distributing medium and two connecting sockets for feeding the two reactants **A** and **B** (see FIG. 1d, wherein fluids **A** and **B** are supplied to the distributing medium/guide structure via separate admission chamber **8** and **9**; column 3, lines 21-31). Although Schubert et al. is silent as to the wall elements being accommodated as a block in a pressure vessel, it would have been obvious for one of ordinary skill in the art at the time the invention was made to provide a pressure vessel to the apparatus of Schubert et al., on the basis of suitability for the intended use, because it is well known in the art to conduct reactions within a pressure vessel if the reaction is to be carried out at a high pressure.

Regarding claim 36, the slot width ("s") of the reaction spaces **12a** approximates the

particular thicknesses of the foils defining channels **13a** and **13b**, which thereby function as spacers to define the width of the reaction spaces **12a**. As disclosed, the thickness of a given foil layer is about 100 micrometers (column 1, line 64 to column 2, line 14). Schubert et al., however, is silent as to varying the thickness of the spacers in order to vary the slot width of the reaction spaces **12a**. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to vary the thickness of the spacers in order to vary the slot width for the reaction spaces **12a** in the apparatus of Schubert et al., on the basis of suitability for the intended use, because changes in size merely involves routine skill in the art, and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller, 105 USPQ 233.*

5. Claims 17-20, 23-32 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ashmead et al. (US 5,690,763).

Regarding claim 17, Ashmead et al. discloses an apparatus comprising a reactor in which there are located a plurality of wall elements (i.e., a plurality of laminae **100-1100**; FIG. 1), a plurality of slot-shaped reaction spaces (i.e., a plurality of slot shaped catalytic reaction channels **90-1'** to **90-8'**; FIG. 16; column 12, line 66 to column 13, line 8), and a plurality of parallel cavities for conducting a fluid heat-exchange medium therethrough (i.e., heat exchanger assemblies **74, 86**; FIG. 10, 13, 14; column 11, line 58 to column 12, line 7; column 12, lines 33-45), wherein the said slot-shaped reaction spaces **90-1'** to **90-8'** are formed between lateral surfaces of two abutting, substantially equally large wall elements made of solid plates (i.e., labeled as plates **1000** and **1100** in FIG. 16), wherein the wall elements being arranged interchangeably in a block (see FIG. 1); wherein the slot-shaped reaction spaces **90-1'** to **90-8'**

are able to have the reactants supplied from the same side of the block (i.e., via chamber **90C1'**; FIG. 16), to guide the reaction mixture through the reaction spaces in the same direction and in parallel flows. Although Ashmead et al. is silent as to, specifically, right-parallelepipedal wall elements and tubular shaped heat exchanger cavities, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select such geometries for the wall elements and heat exchanger cavities in the apparatus of Ashmead et al., on the basis of suitability for the intended use, because changes in shape would merely involve ordinary skill in the art. In particular, Ashmead et al. teaches that, "Depending on the physical and chemical properties of the individual chemicals being processed, or the two or more chemicals being reacted, one skilled in the art can design an apparatus having the requisite size, shape and throughput of tortuous channel and the number, and geometry, of the various laminae," (column 5, lines 57-64). In view of the newly added structural limitations, Ashmead et al. further discloses that the slot width "s" of the reaction spaces amounts to between 0.05 and 5 mm, whereby in case of explosive reaction mixtures the slot width "s" of the reaction spaces is chosen sufficiently small in order to avoid spreading of flames (e.g., channel cross-sections from about 10 to about 5000 micrometers; column 3, lines 42-52; column 6, lines 10-21).

Regarding claim 18, Ashmead et al. discloses at least one feed channel (i.e., communicating with vertical passage **87V**, manifold chamber **90C1'**; FIG. 16; column 12, line 66 to column 13, line 8), which feed channel leads into the reaction space **90-1'** to **90-8'** through at least one of the lateral surfaces of the wall elements.

Regarding claims 19 and 20, Ashmead et al. discloses a distributing medium through which the reaction spaces are capable of being provided with the reactants, wherein the

distributing medium may comprise a solid body with a plurality of channels (i.e., channels of inlet distribution manifolds **40**, **44**, in the case of plural reactants; FIG. 2, 7; column 10, lines 36-55), the cross-sections of which may be chosen to be sufficiently small to avoid spreading of flames in the course of the supply of explosive reactants (column 8, lines 15-29).

Regarding claims 23 and 24, Ashmead et al. discloses the reaction spaces **90-1'** to **90-8'** are either filled with granular catalyst or at least partially coated with catalyst material (e.g., packed with catalyst beads, not shown, or deposited with one or more layers of catalytic material; column 13, lines 1-4; FIG. 16).

Regarding claim 25, Ashmead is silent as to the lateral surfaces of the wall elements facing towards the reaction spaces being provided with a profiled structure for the purpose of enlarging the surface area. However, Ashmead discloses that, "a series of channels **74C** and mesas **74M** are formed in the top surface of wafer **600** the increase the surface area to enhance heat transfer," (column 11, line 58 to column 12, line 7). It would have therefore been obvious for one of ordinary skill in the art at the time the invention was made to provide a profiled structure to the reaction spaces in the apparatus of Ashmead, in order to enhance the heat transfer to or from the reaction being conducted within the reaction spaces.

Regarding claims 26-30, as shown in FIG. 1 and FIG. 2, Ashmead discloses that a plate **100** is provided with one or more inlet ports **20** and **24** to enable the flow of reactants into the apparatus, and one or more outlet ports **30** and **34** to enable the flow of products from the apparatus. However, Ashmead further discloses that, "... the inlet ports **20** and **24** and the outlet ports **30** and **34** do not necessarily have to be positioned through the outer groups. These elements could be designed to meet the integral structure at the side of a lamina, for example."

(column 8, lines 44-56). Additionally, FIG. 4 illustrates a plurality of ports **75** and **76** located at the side of a lamina for conducting heat transfer media. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to provide plates at the sides of the lamina (to cover the narrow sides of the wall elements) for an appropriate feeding and discharge configuration of reactants and/or heat carrier into and out from the wall elements in the apparatus of Ashmead, on the basis of suitability for the intended use, because the shifting of location of parts merely involves ordinary skill in the art, as evidenced by Ashmead, above.

Regarding claim 36, Ashmead et al. teaches that, "Depending on the physical and chemical properties of the individual chemicals being processed, or the two or more chemicals being reacted, one skilled in the art can design an apparatus having the requisite size, shape and throughput of tortuous channel and the number, and geometry, of the various laminae," (column 5, lines 57-64). Thus, it would have been obvious for one of ordinary skill in the art at the time the invention was made to vary and select an appropriate slot width for the reaction spaces in the apparatus of Ashmead, on the basis of suitability for the chemicals being processed.

6. Claims 17, 19, 21, 23 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vu et al. (US 4,820,495) in view of Alagy et al. (US 4,973,777).

Regarding claims 17, 23 and 33, Vu et al. (FIG. 1, 2, 2A; column 2, line 10 to column 3, line 12) discloses an apparatus comprising a reactor (i.e., a pressure vessel **8**) in which there are located a plurality of wall elements (i.e., parallel heat exchange plates **9**), a plurality of slot-shaped reaction spaces (i.e., the spaces between each of plates **9**, containing a bed of solid catalyst **19**), and a plurality cavities for conducting a fluid heat-exchange medium therethrough (i.e., parallel, tubular channels **E** or **F** for conducting a fluid heat carrier via lines **10**, **11**, **13**, **15**);

wherein each of said slot-shaped reaction spaces are formed between lateral surfaces of two abutting, substantially equally large and substantially right-parallelepipedal wall elements **9** made of solid plates that are interchangeably arranged in a block within a virtual right parallelepiped (see Abstract); and wherein the slot-shaped reaction spaces are able to have the reactants supplied from the same side of the block (i.e., via line **18**), and being oriented to guide the reaction mixture through the reaction spaces in the same direction and in parallel flows (i.e., as shown in FIG. 1, downward flow through the plurality of parallel, catalyst **19** containing spaces between plates **9**). With respect to the newly added structural limitation, Vu et al. is silent as to the slot-shaped reaction spaces having a slot width of between 0.05 and 5 mm. In any event, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select an appropriate slot width for the slot-shaped reaction spaces in the apparatus of Vu et al., on the basis of suitability for the intended use, because it has been held that changes in size involve only ordinary skill in the art. *In re Rose*, 220 F.2d 459, 463, 105 USPQ 237, 240 (CCPA 1955), and where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller, 105 USPQ 233*. Furthermore, Alagy et al. evidences that the claimed slot widths are merely conventional. Alagy et al. teaches an apparatus wherein the slot width (i.e., for channels **11**; FIG. 1A, 1B) advantageously ranges from 3 to 50 mm in order to provide good temperature stability in the reaction zone (see column 8, lines 7-17).

Regarding claims 19 and 21, a layer **43** of solid particles may be provided at the base of the reactor block, to enable easy catalyst withdrawal without disassembling the reactor and its internal parts. The solid particles are characterized by an average diameter from one-half to one-

thousandth the average diameter of the catalyst particles (column 5, lines 16-35). Vu et al. further discloses that in the present process, the gas charge may instead be introduced via the bottom of the reactor (column 5, line 66 to column 6, line 2). According to such a configuration, the layer **43** of solid particles functions as the instantly claimed distributing medium. Although Vu et al. is silent as to whether the particles sizes and interspaces are sufficiently small to avoid spreading of flames due to explosive reactants, it would have been obvious for one of ordinary skill in the art at the time the invention was made to select an appropriate size for the particles and interspaces of layer **43** in the apparatus of Vu et al., on the basis of suitability for the intended use, because changes in size merely involves routine skill in the art, and it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art, *In re Aller, 105 USPQ 233.*

Response to Arguments

7. Applicant's arguments filed on May 25, 2005 with respect to the restriction requirement (beginning page 10, third paragraph, of the response) have not been considered because the restriction requirement was made FINAL in the prior Office Action. After a FINAL requirement for restriction, the Applicant, in addition to making any reply due on the remainder of the action, may petition the Commissioner to review the requirement. Petition may be deferred until after final action on or allowance of claims to the invention elected, but must be filed not later than appeal. A petition will not be considered if reconsideration of the requirement was not requested (see § 1.181. 37 CFR 1.144).

8. Applicant's arguments filed on May 25, 2005 with respect to the rejection of the claims in view of Schubert et al. (US 5,803,600) have been fully considered but they are not persuasive.

On page 11, second to last paragraph, to page 13, third paragraph, Applicants argue,

> "...the description in col. 3 contains no disclosure whatsoever of the structure and geometry of the partial mixing chambers 12a. Accordingly, the allegation in the Official Action that the partial mixing chambers are slot shaped can be based only on Figure 3b of the reference. It seem that the Official Action has not acknowledged a feature of the partial mixing chambers 12a shown in Figure 3b and, therefore, incorrectly ascribes the wrong geometry of these chambers from the drawings."
>
> "It appears that the Official Action has not acknowledged that the dashed lines shown near the bottom of elements 12a in Figure 3b clearly indicate that these elements must have the same structure of foils with grooves as the similar depicted elements 13a and 13b; the only difference being having twice the foil thickness. Accordingly, the allegations in the Official Action that features 12a of Figure 3b are slot-shaped spaces between foil elements 12b is in clear contradiction to the disclosure of Figure 3b of the reference."

The Examiner respectfully disagrees. According to *The American Heritage® Dictionary of the English Language*, Fourth Edition, Copyright ©2000 by Houghton Mifflin Company (found at http://www.dictionary.com), a "slot" is by definition "a narrow opening; a groove or slit". The Examiner has acknowledged that the dashed lines shown near the bottom of elements **12a** in Figure 3b illustrate that the elements **12a** are similar to those of elements **13a** and **13b**, except with a foil thickness approximately twice that of elements **13a** and **13b**. This structure, however, still meets the definition of a reaction chamber being "slot-shaped". As can be seen in the various figures for element **6** (as an example of how the elements **12a** would be similarly shaped; FIG. 1a, 1b, 1c), each of the foils **1** and **2** are formed by grooves **4** and **5**, that when placed one on top of another form a plurality of openings, designated as passages **1b** and **2b**. Given that the grooves **4** and **5** preferably have a width of less than 250 micrometers and a depth of less than 70

micrometers (see claims 1-3), one having ordinary skill in the art would have considered the passages **1b** and **2b** to be sufficiently small to be defined as "narrow openings". Similarly, the width and depth of the elements **12b** would have been considered sufficiently small (despite the slot width being twice that of elements **13a, 13b**) to be defined as "narrow openings".

In addition, Applicants argue,

> "... Schubert does not disclose a device wherein wall elements are arranged interchangeability. Thus, there is no indication in the reference that the foils of the disclosed device may be interchanged and the only disclosure on how the foils are joined in col. 3, lines 9-13, refers to diffusion welding which inevitably leads to a device where the foils cannot be interchanged."

The Examiner respectfully disagrees. Given that every other element **12a** is identical, every other element **13a** is identical, and every other element **13b** is identical, each of the elements **12a**, **13a** and **13b** may be interchanged with another element **12a**, **13a** and **13b**, respectively, and still form an identical stack. (see FIG. 3b).

Furthermore, on page 17, last paragraph, of the response, Applicants argue,

> "The apparatus disclosed by Schubert is assembled from foils with grooves cut into the surface of such foils. A skilled person in the art with knowledge of the apparatus of Figure 3b would only arrive at an apparatus as claimed in the application if he would replace the foils 12b with grooves cut into the surface by foils having tubular cavities inside the foil and at the same time, omitting the foils 12a."

The Examiner respectfully disagrees and maintains that the apparatus of Schubert structurally meets the claims (see rejection made above). It is noted that the features upon which applicant relies (i.e., limitations to differentiate applicant's structure from the structure of Schubert; e.g., a particular tubular cavity structure, etc.) are not recited in the rejected claim(s). Although the

claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

9. Applicant's arguments filed on May 25, 2005 with respect to the rejection of the claims in view of Vu et al. (US 4,820,495) have been fully considered, but they are now moot in view of the new grounds of rejection.

10. Applicant's arguments filed on May 25, 2005 with respect to the rejection of the claims in view of Ashmead et al. (US 5,690,763) have been fully considered but they are not persuasive. On page 15, second paragraph, to page 17, second paragraph, Applicants argue,

> "The reactor channels 90-1' to 90-8'... are fundamentally different from the slot-shaped reaction spaces of the application in that the lateral surfaces of laminae 1000 and 1100 shown in Figure 16 of the reference are in direct contact with each other. This leaves no space in between except for the recesses formed by the grooves in the surface of laminae 1000 and 1100. Consequently, the reactor channels 90-1' and 90-8' are confined to the areas of such recesses whereas the reaction space of the claimed invention extends across the full area of the lateral surfaces forming the reaction space."

The Examiner respectfully disagrees. Again, a "slot" is by definition "a narrow opening; a groove or slit". As can be seen in Figure 16 of Ashmead, each of the reaction spaces is formed by a series of grooves **90-1'** to **90-8'**. Upon the stacking of plates **1000** and **1100**, the confined reaction spaces comprise narrow openings, given that each of the grooves **90-1'** to **90-8'** may be merely 10 micrometers in width (see column 3, lines 42-52; column 6, lines 10-2). Thus, the Examiner maintains that the reaction spaces in the apparatus of Ashmead structurally meet the claim limitation of "slot-shaped reaction spaces". Additionally, it is noted that the feature upon which applicant relies (i.e., a reaction space that extends across the full area of the lateral

surfaces forming the reaction space) is not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant further argues,

> "The heat exchanger assembly as shown in Figures 10, 13 and 14... do not comprise wall elements with tubular cavities for conducting a fluid exchange medium reaching through a wall element. In the assembly of Figure 10, the heat exchanging fluid enters through the inlet port 75 and leaves through outlet port 76... The fluid is not passed through any tubular cavity reaching through the wall elements 500 or 600. All the cavities reaching through the wall elements are necessary for passing through reactants or reaction products and the device would not fulfill the intended purpose if heat-exchanging fluid would be passed through one of these cavities. The same holds for the cavities of the wall elements 800, 900 and 1000, which form the heat exchanger assemblies of Figures 13 and 14."

The Examiner respectfully disagrees. The reactants or reaction produces which pass through the cavities reaching through the wall element may also fulfill the intended purpose of a heat-exchanging fluid, as evidenced by column 12, lines 32-45, of Ashmead. For instance,

> "Heat exchanger 86 comprises both the passages 87 of FIG. 13, through which the mixed, but yet unreacted, reactants flow and the passages 88 of FIG. 14 through which the chemically reacted material flows. The heat exchanger *transfers heat between the chemically reacted material* flowing from the photoreactor *and the mixed reactants* flowing into the heat exchanger from the mixer array 60 (FIG. 7) through vertical passage 50V." (emphasis added).

Applicant further argues,

> "It is noted that the Official Action that a person of ordinary skill in the art would consider the geometry of the reaction spaces formed in the claimed apparatus as being

suitable for the intended use of the apparatus of *Ashmead*. Applicants respectfully submit that this allegation is in clear contradiction to the teachings of the reference. Indeed, *Ashmead* explicitly teaches that the apparatus requires a tortuous channel for passing the reactant through to fulfill its purpose."

The Examiner respectfully disagrees. It is noted that in FIG. 16, Ashmead discloses channels, as defined by grooves **90-1'** to **90-8'**, which are not tortuous.

11. The rejection of claims 17, 23-25 and 33 under 35 U.S.C. 102(b) as being anticipated by Haselden (US 3,528,783) has been withdrawn in view of Applicant's amendment.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

As set forth in 37 CFR 1.136(a), a shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

* * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is (571) 272-1449.

The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jennifer A. Leung
November 10, 2005

Hien Tran

HIEN TRAN
PRIMARY EXAMINER